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EXAMINER

VU, NGOC K

ART UNIT PAPER NUMBER

2623

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/768,843

Applicant(s)

HORN ET AL.

Examiner

Ngoc K. Vu

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 February 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-54 and 56-95 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-54 and 56-95 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 2/16/06 has been entered.

Response to Arguments

2. Applicant's arguments with respect to claims 1-43 and 68-95 have been considered but are moot in view of the new ground(s) of rejection.

Allowable Subject Matter

3. The indicated allowability of claims 44-54 and 56-67 is withdrawn in view of rejection under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. Rejections are addressed follow.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 1-43 and 68-95 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

With respect to claims 1, 43, 68, 69 and 94, the newly added limitation of the output symbols are encoded to be served/transmitted/received to/by the client in an order independent of the output symbols previously received by the client is not disclosed in the specification. The original specification describes that output symbols are provided to transmit module 240 from block encoder 215, the output symbols are then transmitted in an order that is different from the order in which the transmit module 240 received (see Specification: page 18, lines 3-11). That is, the transmit module 240 transmits the output symbols to the client in an order that is different from the order in which transmitter module received the output symbols from the block encoder 215. In other words, the symbol outputs are transmitted to the client in an order independent of the order of the output symbols received by the transmitter *not* the client or receiver. Thus, nowhere in the specification supports the above limitation as recited in the claims.

6. Claims 44-67, 86 and 95 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Specifically, claim 44, lines 10-12, recites the limitations "determining an order in which to encode blocks; generating output symbols for each block in the order using a chain reaction code to generate output symbols". Claim 86 recites the limitation "reassembling the blocks in each segment includes decoding with a chain reaction decoder" while independent claim 69 recites the newly added limitation "the output symbols are encoded to be received by the client in an order ...". Similarly, claim 95 recites the limitation "the blocks are encoded into the output symbols according to a chain reaction code" while independent claim 1 recites "the output symbols are encoded to be served to the client in an order ...".

However, the specification clearly describes "In one embodiment, the blocks or segments are received and decoded in order. It is to be understood, however, that a chain reaction code need not to be used, and that each block need not to be encoded and decoded separately as described in the Scheduling Multiple Files Application."; "Where the blocks in each segment are encoded using chain reaction codes, there is no difficulty associated with partitioning the content of a block among many channels, since a specific set, or order, of output symbols is not required, and multiple independent streams of output symbols are information additive." (See Specification: page 18, lines 17-20; page 28, lines 29-31). That is, if the blocks are encoded/decoded in order, a chain reaction code is not used. In reverse, if the blocks are encoded using chain reaction codes, a specific set, or order of output symbols is not required. Accordingly, the above limitations recited in claims 44, 86 and 95 are contradictory with the disclosures in the specification. Therefore, claims 44-54, 56-67, 86, and 95 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement.

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 1-43 and 68-95 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With respect to claim 1, it is unclear whether the limitation "the output symbols" in line 12 "the output symbols" in the line 11. Appropriate correction is required.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

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the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 1-12, 14, 15, 17-19 and 21-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kermode et al. (U.S. 6,018,359 A) in view of Sakoda et al. (US 6,882,618 B1).

Regarding claim 1, Kermode discloses a method of scheduling a media object for transmission between a server (100 – see figure 1) and a client (115, 120 – see figure 1), the method comprising:

partitioning the media object into segments of blocks (a video file, such as movie, is divided into a series of sequentially organized data segments), wherein each block is a unit of media for which the client will wait to receive an entire block before playing out the block a segment is not actually played back until it is download in its entirety. This condition ensures that no segment will be played before its beginning has been downloaded), and wherein each segment includes an integer number of blocks (each data segment having an internal temporal order) (see col. 4, lines 29-32; col. 6, lines 37-44; col. 7, lines 21-23 and abstract);

determining one or more channels on which to serve each segment, the channels capable of carrying data between the server and the client (all segments for a particular movie are transmitted over one or more channels from the server to the receiver – see col. 5, lines 15-18 and 59-62 and col. 6, lines 9-13);

determining a rate at which to serve each segment (determining download rate of the segments - see col. 8, lines 19-29); and

determining a schedule pair for each channel, the schedule pair including a time at which the client may start receiving on the channel and a time at which the client may stop receiving on the channel (data is loaded asynchronously over channel P_A, so that download

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may commence at an arbitrary time t' and continue until time t' is reached during the next iterative transmission of the segment. That is, the receiver can begin downloading segment from a new channel as soon as a previous segment has been fully downloaded – see col. 6, lines 14-31).

Kermode further discloses that the receiver can begin downloading from a new channel as soon as a previous segment has been fully downloaded; it is not necessary to wait for the segment to loop back to its beginning (see col. 6, lines 16-19). The receiver can play movies back with no latency while loading in higher-order segments in the manner addressed above. The system of Kermode operates independently of subscriber viewing patterns, simply transmitting data, blocks delivery unwanted partitions and replaces them with partitions from desired movies (see col. 9, lines 14-16, 40-44 and 65-67).

Kermode does not teach that output symbols generated are independent of when a client begins reception, and the output symbols are encoded to be provided to client in an order independent of the output symbols previously received by the client. However, Sakoda teaches that a symbol stream produced by a symbol mapping circuit 213 is input to a circuit 204. A transmission symbol stream output by circuit 204 or circuit 205 is input to the multiplex 206. The multiplex circuit 206 multiplexes the transmission symbol stream of the M channels and the transmission symbol streams of other plurality of channels and outputs a multiplexed symbol stream to transmit to a receiver. It is important to note that the transmission symbol stream rearranged by an interleave circuit 202 in a transmitting apparatus is processed in reverse, so the data forming the received and encoded symbol stream is rearranged to the original order (see col. 8, line 43 to col. 9, line 14; col. 10, lines 20-26 and 38-42 and figures 1-2). That is, Sakoda teaches providing encoded output symbols to the receiver in an order that is different from the order of output symbols received. Therefore, it would have been obvious to one of

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ordinary skill in the art at the time the invention was made to modify the system of Kermode by providing encoded output symbols to the receiver in an order that is different from the order of output symbols received to improve the efficiency of data transmission.

Regarding claim **2**, Kermode discloses that if the client minimally fulfills the schedule pair for each channel, the client will be able to play out the media object uninterrupted after a startup latency (see col. 9, lines 14-16; col. 5, lines 53-62; col. 6, lines 37-44).

Regarding claims **3 and 4**, Kermode discloses dividing the video file into a plurality of sequentially organized data segments, each data segment has an internal temporal order (see abstract).

Regarding claims **6-8 and 17**, Kermode discloses that segments are preferably downloaded at a rate at least equal to the playback rate, and desirably faster than the playback rate. When the segments reach the loaded as fast as it is consumed for display, and is received over a single channel, the data cannot be received at a rate greater than the playback rate (see col. 7, lines 7-9; col. 8, lines 8-11 and 22-26).

Regarding claims **9-12, 31, 34, 36-38**, Kermode teaches that at least one segment includes one or more block internally, and the blocks in the segment are same size (see abstract and col. 4, lines 29-31).

Regarding claim **14**, Kermode teaches that at least two segments have different sizes (see col. 6, lines 45-65).

Regarding claim **15**, Kermode teaches that each block in each segment is transmitted over one channel having the same rate (see col. 7, lines 7-14).

Regarding claims **18, 19, and 28**, Kermode teaches that segments are served on two channels at a same rate (see col. 7, lines 7-9; col. 5, lines 59-62).

Regarding claims **21 and 23**, Kermode discloses that the number of channels is equal to a number of concurrent channels at the client or served by the server (see col. 5-6, lines 62-4).

Regarding claim **22**, Kermode discloses that the client can minimally fulfill the schedule pair for each channel by downloading from a maximum number of concurrent channels, e.g., two channels (see col. 5, lines 59-62).

Regarding claims **24, 25, and 30**, Kermode teaches determining one or more channels, rate, a schedule pair steps are performed so as to optimize a server bandwidth required to provide the video file to client at a rate (e.g., playback rate) less than or equal to a maximum client download rate (download rate) (see col. 7, lines 7-9 and 60-62; col. 8, lines 6-29).

Regarding claim **26**, Kermode teaches determining a size of the segments so that the segment is completely downloaded by the client prior to when the segment is due to be played out (see col. 7, lines 21-24).

Regarding claim **27**, Kermode teaches the rate at which to serve the segments is an integer multiple of a base rate (see col. 6, lines 45-57).

Regarding claim **29**, Kermode teaches the receivers receive segments over two channels. The receiver can begin download segment from a new channel as soon as a previous segment has been fully downloaded (see col. 6, lines 16-20; col. 7, lines 36-40; col. 5, lines 59-62).

Regarding claims **32, 33, and 39**, Kermode teaches that sizes of segments are each less than or equal to a maximum segment size, wherein the maximum segment size is based on a maximum available storage at the client (see col. 5, lines 53-58 and col. 8, lines 56-60).

Regarding claim **35**, Kermode teaches determining block size by an encoding scheme (see col. 8, lines 30-33; col. 9, lines 20-23).

Regarding claims **40-42**, Kermode teaches that segment is served on at least two channels, wherein a rate at which the segment is served on one of the at least two channels varies over time (see col. 5, lines 59-62; col. 7, line 66 col. 8, line 29).

Regarding claim **43**, Kermode discloses a system for scheduling a media object for transmission between a server (100 – see figure 1) and a client (115, 120 – see figure 1), comprising:

a module for partitioning the media object into segments of blocks, wherein the segments contain one or more blocks (a video file, such as movie, is divided into a series of sequentially organized data segments), wherein each block is a unit of media for which the client will wait to receive an entire block before playing out the block a segment is not actually played back until it is download in its entirety. This condition ensures that no segment will be played before its beginning has been downloaded), and wherein each segment includes an integer number of blocks (each data segment having an internal temporal order) (see col. 4, lines 29-32; col. 6, lines 37-44; col. 7, lines 21-23 and abstract);

a module for determining one or more channels on which to serve each segment, the channels capable of carrying data between the server and the client (all segments for a particular movie are transmitted over one or more channels from the server to the receiver – see col. 5, lines 15-18 and 59-62 and col. 6, lines 9-13);

a module for determining a rate at which to serve each segment (determining download rate of the segments - see col. 8, lines 19-29); and

a module for determining a schedule pair for each channel, the schedule pair including a time at which the client may start receiving on the channel and a time at which the client may stop receiving on the channel (data is loaded asynchronously over channel P_A , so that download may commence at an arbitrary time t' and continue until time t' is reached during the

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next iterative transmission of the segment. That is, the receiver can begin downloading segment from a new channel as soon as a previous segment has been fully downloaded – see col. 6, lines 14-31).

Kermode further discloses that the receiver can begin downloading from a new channel as soon as a previous segment has been fully downloaded; it is not necessary to wait for the segment to loop back to its beginning (see col. 6, lines 16-19). The receiver can play movies back with no latency while loading in higher-order segments in the manner addressed above. The system of Kermode operates independently of subscriber viewing patterns, simply transmitting data, blocks delivery unwanted partitions and replaces them with partitions from desired movies (see col. 9, lines 14-16, 40-44 and 65-67).

Kermode does not teach that output symbols generated are independent of when a client begins reception, and the output symbols are encoded to be provided to client in an order independent of the output symbols previously received by the client. However, Sakoda teaches that a symbol stream produced by a symbol mapping circuit 213 is input to a circuit 204. A transmission symbol stream output by circuit 204 or circuit 205 is input to the multiplex 206. The multiplex circuit 206 multiplexes the transmission symbol stream of the M channels and the transmission symbol streams of other plurality of channels and outputs a multiplexed symbol stream to transmit to a receiver. It is important to note that the transmission symbol stream rearranged by an interleave circuit 202 in a transmitting apparatus is processed in reverse, so the data forming the received and encoded symbol stream is rearranged to the original order (see col. 8, line 43 to col. 9, line 14; col. 10, lines 20-26 and 38-42 and figures 1-2). That is, Sakoda teaches providing encoded output symbols to the receiver in an order that is different from the order of output symbols received. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of Kermode by

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providing encoded output symbols to the receiver in an order that is different from the order of output symbols received to improve the efficiency of data transmission.

11. Claims 68-74, 77, 80-85 and 87-94 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krause et al. (US 5,926,205 A) in view of Sakoda et al. (US 6,882,618 B1).

Regarding claim **68**, Krause discloses an apparatus for serving a media object, the method comprising:

a block encoder (22 – see figure 2) receiving segments of a media object, wherein each segment includes an integer number of blocks, wherein each segment includes an integer number of blocks, and wherein each block is a unit of media for which a client will wait to receive an entire block before playing out the block (see col. 6, lines 42-51; col. 7, lines 12-16), an input to receive an order in which to encode blocks (see col. 8, lines 54-62);

a transmitter (within server 31 – see figure 2) coupled receiving an indication of one or more channels on which to serve the segment (e.g., video segment identification information - see col. 7, lines 12-16 and 42-45) and a rate at which to server the segment (e.g., transmission rate - see col. 7, lines 1-7); and the transmitter configured to serve each segment at the corresponding rate over a channel (see col. 7, lines 1-7).

Krause teaches that a video program is divided into a number of video segments. The segments are partitioned into N ordered subsequences of elements. When the video program is distributed to a receiver as a data stream that starts at the beginning of the sequence of elements (i.e., the first element of segment 1 as denoted by reference numeral 12) and ends with the last element of segment n (i.e., denoted by reference numeral 16). During transmission, one element belonging to each segment is transmitted during the time slot assigned for elements from that segment. Krause further teaches that the sequence of elements are

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encoded by a digital encoder and then partitioned by a circuit into N ordered subsequences of elements each representative of one of N video segments. When the receiver selects and assembles the elements which form the segments of the video program (see col. 6, lines 42-51 and 65-67; col. 7, lines 20-33; col. 8, lines 22-27 and 56-65). That is, Krause teaches encoding ordered subsequences of elements of each of segments of video program. The encoding is therefore performed before or during transmission of the video program.

Krause does not teach that output symbols generated are independent of when a client begins reception, and the output symbols are encoded to be provided to client in an order independent of the output symbols previously received by the client. However, Sakoda teaches that a symbol stream produced by a symbol mapping circuit 213 is input to a circuit 204. A transmission symbol stream output by circuit 204 or circuit 205 is input to the multiplex 206. The multiplex circuit 206 multiplexes the transmission symbol stream of the M channels and the transmission symbol streams of other plurality of channels and outputs a multiplexed symbol stream to transmit to a receiver. It is important to note that the transmission symbol stream rearranged by an interleave circuit 202 in a transmitting apparatus is processed in reverse, so the data forming the received and encoded symbol stream is rearranged to the original order (see col. 8, line 43 to col. 9, line 14; col. 10, lines 20-26 and 38-42 and figures 1-2). That is, Sakoda teaches providing encoded output symbols to the receiver in an order that is different from the order of output symbols received. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of Krause by providing encoded output symbols to the receiver in an order that is different from the order of output symbols received to improve the efficiency of data transmission.

Regarding claim 69, Krause discloses a method of receiving a media object that includes segments of blocks, wherein each segment includes an integer number of blocks, and wherein

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each block is a unit of media for which a client will wait to receive an entire block before playing out the block (see col. 6, lines 42-51; col. 7, lines 12-16), the method comprising:

receiving a media object description (video segment identification information) of the media object (see col. 7, lines 12-16 and 42-45);

joining and leaving each of a plurality of channels according to the media object description to download the segments (during each transmission of the interleaved data stream over channels, a receiver must be able to identify the elements of the particular video segment to be accessed, reconstructed and displayed, wherein the video segment identifiers are inserted into the interleaved sequence of elements as they are being transmitted to the receivers – see col. 12, lines 24-52; col. 6, lines 42-62);

reassembling the blocks in each segment (assembling the received elements in each segment – see col. 7, lines 12-33); and

playing the blocks out in an order after a startup latency (the receiver plays the video program by assembling, for each video segment, the subsequence of elements representative of the segment – see col. 8, lines 44-65; col. 9, lines 48-65; col. 12, lines 24-60).

Krause teaches that a video program is divided into a number of video segments. The segments are partitioned into N ordered subsequences of elements. When the video program is distributed to a receiver as a data stream that starts at the beginning of the sequence of elements (i.e., the first element of segment 1 as denoted by reference numeral 12) and ends with the last element of segment n (i.e., denoted by reference numeral 16). During transmission, one element belonging to each segment is transmitted during the time slot assigned for elements from that segment. Krause further teaches that the sequence of elements are encoded by a digital encoder and then partitioned by a circuit into N ordered subsequences of elements each representative of one of N video segments. When the receiver selects and

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assembles the elements which form the segments of the video program (see col. 6, lines 42-51 and 65-67; col. 7, lines 20-33; col. 8, lines 22-27 and 56-65). That is, Krause teaches encoding ordered subsequences of elements of each of segments of video program. The encoding is therefore performed before or during transmission of the video program.

Krause does not teach that output symbols generated are independent of when a client begins reception, and the output symbols are encoded to be provided to client in an order independent of the output symbols previously received by the client. However, Sakoda teaches that a symbol stream produced by a symbol mapping circuit 213 is input to a circuit 204. A transmission symbol stream output by circuit 204 or circuit 205 is input to the multiplex 206. The multiplex circuit 206 multiplexes the transmission symbol stream of the M channels and the transmission symbol streams of other plurality of channels and outputs a multiplexed symbol stream to transmit to a receiver. It is important to note that the transmission symbol stream rearranged by an interleave circuit 202 in a transmitting apparatus is processed in reverse, so the data forming the received and encoded symbol stream is rearranged to the original order (see col. 8, line 43 to col. 9, line 14; col. 10, lines 20-26 and 38-42 and figures 1-2). That is, Sakoda teaches providing encoded output symbols to the receiver in an order that is different from the order of output symbols received. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of Krause by providing encoded output symbols to the receiver in an order that is different from the order of output symbols received to improve the efficiency of data transmission.

Regarding claims **70 and 71**, Krause discloses that the receiver begins to reconstruct a video program from its beginning, the receiver selects and assembles each element having a sequence number of 1 during the first pass, followed by the elements having a sequence number of 2 during the second pass and so on. The receiver identifies the elements of the video

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segment to be accessed, reconstructed and displayed based on video segment identification information (see col. 12, lines 24-60).

Regarding claims **72-74**, Krause discloses broadcasting segments via channels (see col. 5-6, lines 64-4; col. 7, lines 34-41).

Regarding claim **77**, Krause discloses that data is downloaded by a client at an unconstrained rate (see col. 7, lines 3-6).

Regarding claims **80-82**, Krause discloses that the receiver begins to reconstruct a video program from its beginning, the receiver selects and assembles each element having a sequence number of 1 during the first pass, followed by the elements having a sequence number of 2 during the second pass and so on. Krause further discloses that video segments which make up the video programs are essentially time-division multiplexed over sub-channels of the channel over which the video program is broadcast. The receiver can therefore be made to reconstruct and present any of the video segments to the subscriber by selecting the sub-channel carrying the desired segment. This is also related to the rate at which the data stream can be transmitted over the distribution network as well as the rate at which data must be received by the receiver to permit real-time reconstruction of the video segments (see col. 5-6, lines 53-4; col. 6, lines 52-67; col. 12, lines 24-60).

Regarding claim **83**, Krause teaches that the receiver increases its reception rate when it experience no congestion and decreases its reception rate when it experiences congestion since the receiver is permitted real-time reconstruction of the video segments at the desired level of the picture quality (see col. 5-6, lines 59-4).

Regarding claim **84**, Krause teaches that reassembling the blocks in each segment includes reordering the original data according to its temporal position in each block (see col. 12, lines 24-45).

Regarding claim **85**, Krause discloses that the receiver processes reassembling and decoding the segment (see col. 8, lines 44-53). Krause does not explicitly disclose a FEC decoder for decoding. Official Notice is taken that FEC unit is used to perform error correction and decoding to output the video signal is well known in the art. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the receiver of Krause by including FEC unit in order to perform error correction and decoding to output the video signal.

Regarding claims **87-90**, Krause shows that video segments are provided from server 31 to receiver 32 as illustrated in figure 2 (see figure 2). Krause does not specifically disclose the video segments are provided from at least two servers. Official Notice is taken that providing video programs from two or more servers to subscribers over the network is well known in the art. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of Krause by providing video programs from two or more servers to receivers in order to accommodate large number of clients.

Regarding claim **91**, Krause teaches playing a pre-downloaded segment during the startup latency (see col. 9, lines 42-44 and 48-51).

Regarding claim **92**, Krause teaches that the video program is downloaded by a receiver from a maximum number of channels concurrently (see col. 5-6, lines 64-2).

Regarding claim **93**, Krause teaches that segment is download via channels varies over time (see col. 6, lines 59-67).

Regarding claim **94**, Krause discloses a system for receiving a media object that includes segments of blocks, wherein each segment includes an integer number of blocks, and wherein each block is a unit of media for which a client will wait to receive an entire block before playing out the block (see col. 6, lines 42-51; col. 7, lines 12-16), comprising:

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a module for handling input of a media object description (receiving video segment identification information) of the media object (see col. 7, lines 12-16 and 42-45);

a module for handling for channel joins and channel leaves for each of a plurality of channels according to the media object description to download the segments (during each transmission of the interleaved data stream over channels, a receiver must be able to identify the elements of the particular video segment to be accessed, reconstructed and displayed, wherein the video segment identifiers are inserted into the interleaved sequence of elements as they are being transmitted to the receivers – see col. 12, lines 24-52; col. 6; lines 42-62);

a module for handling for reassembling the blocks in each segment (assembling the received elements in each segment – see col. 7, lines 12-33); and

a module for handling for playing the blocks out in an order after a startup latency (the receiver plays the video program by assembling, for each video segment, the subsequence of elements representative of the segment – see col. 8, lines 44-65; col. 9, lines 48-65; col. 12, lines 24-60).

Krause teaches that a video program is divided into a number of video segments. The segments are partitioned into N ordered subsequences of elements. When the video program is distributed to a receiver as a data stream that starts at the beginning of the sequence of elements (i.e., the first element of segment 1 as denoted by reference numeral 12) and ends with the last element of segment n (i.e., denoted by reference numeral 16). During transmission, one element belonging to each segment is transmitted during the time slot assigned for elements from that segment. Krause further teaches that the sequence of elements are encoded by a digital encoder and then partitioned by a circuit into N ordered subsequences of elements each representative of one of N video segments. When the receiver selects and assembles the elements which form the segments of the video program (see col. 6, lines 42-51

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and 65-67; col. 7, lines 20-33; col. 8, lines 22-27 and 56-65). That is, Krause teaches encoding ordered subsequences of elements of each of segments of video program. The encoding is therefore performed before or during transmission of the video program. From the feature of encoding and transmission the video program as addressed above, the system of Krause, therefore, provides enough sequences of elements of segments to allow the receiver assembles properly the received segments for playing the video program.

Krause does not teach that output symbols generated are independent of when a client begins reception, and the output symbols are encoded to be provided to client in an order independent of the output symbols previously received by the client. However, Sakoda teaches that a symbol stream produced by a symbol mapping circuit 213 is input to a circuit 204. A transmission symbol stream output by circuit 204 or circuit 205 is input to the multiplex 206. The multiplex circuit 206 multiplexes the transmission symbol stream of the M channels and the transmission symbol streams of other plurality of channels and outputs a multiplexed symbol stream to transmit to a receiver. It is important to note that the transmission symbol stream rearranged by an interleave circuit 202 in a transmitting apparatus is processed in reverse, so the data forming the received and encoded symbol stream is rearranged to the original order (see col. 8, line 43 to col. 9, line 14; col. 10, lines 20-26 and 38-42 and figures 1-2). That is, Sakoda teaches providing encoded output symbols to the receiver in an order that is different from the order of output symbols received. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of Kermode by providing encoded output symbols to the receiver in an order that is different from the order of output symbols received to improve the efficiency of data transmission.

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12. Claims 13, 16, and 20, are rejected under 35 U.S.C. 103(a) as being unpatentable over Kermode et al. (U.S. 6,018,359 A) in view of Sakoda et al. (US 6,882,618 B1) and further in view of Bolosky et al. (US 6,134,596 A).

Regarding claims **13, 16 and 20**, Kermode teaches serving segments over two channels (see col. 5, lines 59-62). Kermode does not explicitly teach serving at different rates. However, Bolosky teaches that the system is configured to deliver data streams at multiple data rates. That is, the system delivers of multiple data streams at different data rates (see col. 11, lines 17-25). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of Kermode by serving data streams at different data rates as taught by Bolosky in order to make efficient use of storage and network resources.

13. Claims 75 and 76 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krause et al. (US 5,926,205 A) in view of Sakoda et al. (US 6,882,618 B1) and further in view of Bolosky et al. (US 6,134,596 A).

Regarding claims **75 and 76**, Krause does not disclose a plurality of segments are downloaded concurrently at an aggregate rate, and wherein the aggregate rate is less than a maximum download rate. However, Bolosky discloses that data streams 0-8 have one of four different data rates ranging from 1 to 4 Mb/s, while each server network card has a maximum data rate of 10 Mb/s (see col. 14, lines 4-10). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of Krause by providing data streams at a rate that is less than a maximum data rate as taught by Bolosky in order to efficiently transmit data to clients over the network.

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14. Claims 78 and 79 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krause et al. (US 5,926,205 A) in view of Sakoda et al. (US 6,882,618 B1) and further in view of Kermode et al. (U.S. 6,018,359 A).

Regarding claims **78 and 79**, Krause does not explicitly download rate is greater than or less than play out rate. However, Kermode discloses that segments are preferably downloaded at a rate at least equal to the playback rate, and desirably faster than the playback rate. When the segments reach the loaded as fast as it is consumed for display, and is received over a single channel, the data cannot be received at a rate greater than the playback rate (see col. 7, lines 7-9; col. 8, lines 8-11 and 22-26). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of Krause by including download rate is greater than or less than playback rate as taught by Kermode in order to provide high quality playback the video data.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ngoc K. Vu whose telephone number is 571-272-7306. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John W. Miller can be reached on 571-272-7353. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. It is important to note that Art Unit 2611 has been changed into Art Unit 2623.

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Ngoc K. Vu
Primary Examiner
Art Unit 2623

March 27, 2006